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A handwritten signature in cursive script, appearing to read "J. Billingsley".

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AUSTRALIA

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PROVISIONAL SPECIFICATION

Invention Title: "AN IMPROVED SECURITY SCREEN
DOOR FOR MOBILE HOMES"

The invention is described in the following statement:

TITLE

AN IMPROVED SECURITY SCREEN DOOR FOR MOBILE HOMES

FIELD OF THE INVENTION

5 The invention relates to security screen door for mobile homes, caravans, campervans and the like. In particular, although not exclusively, the invention relates to an improved screen door for mobile homes that provides for greater levels of security against intrusion without compromising the safety of the occupants in the event of fire or similar life threatening incidents.

BACKGROUND TO THE INVENTION

10 Holidaymakers are increasingly utilizing mobile homes, caravans, campervans and similar recreational vehicles as a means for taking travelling holidays. This form of holiday is especially popular with retirees and older couples as it provides for a flexible and cost efficient way of taking a holiday.

15 Mobile homes and the like generally comprise a front cab section for driving the vehicle and a rear accommodation compartment comprising living, eating and sleeping areas. The rear compartment is accessed from outside the vehicle through a solid and secure outer door, usually on the side or back of the vehicle, and a less secure inner door in the form of a screen.

20 When the mobile home is, for example, at a camping location, the solid outer door is often left open and the screen is kept closed. This facilitates ventilation of the vehicle, allows the ingress of light, offers a view through the doorway if the mobile home is parked in a scenic location and prevents the

ingress of insects. Screens known in the art are either lockable or non-lockable and may be unlocked from the inside or from the outside by means of a key.

In the case of the non-lockable screen, no security is provided for valuables and/or people within the mobile home by the screen door alone.

5 Hence, it is not possible to leave the outer door open and only the screen closed while the occupants are away from the mobile home or asleep at night without the contents of the vehicle being susceptible to theft or the safety of the occupants being threatened by intruders.

10 Known lockable screens for campervans and mobile homes offer only limited levels of security against intruders because the mesh of conventional screens is easily cut. Furthermore, the screen door can be kicked away from the supporting frame relatively easily and hence offers little security against a determined intruder.

15 Lockable screens known in the art for mobile homes and the like can also represent a danger to the occupants of the vehicle in the event of an emergency such as a fire. For example, consider a fire that has broken out within the mobile home and the occupants have left the security screen locked. If the occupants have not left the key in the inner lock there is a real danger that they may become trapped within the campervan and perish.

20 Also, in situations of danger, such as in the case of a fire mentioned above, people often tend to act in an irrational manner and the process of having to unlock the screen from the inside may be too complicated for someone who is hysterical and frightened. This is especially the case for older people and therefore this problem is particularly relevant to the mobile home and campervan industry.

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OBJECT OF THE INVENTION

It is an object of the present invention to provide a security screen door for mobile homes and the like that overcomes at least some of the identified problems in the prior art or provides the consumer with a viable commercial alternative.

Further objects will be evident from the following description.

DISCLOSURE OF THE INVENTION

In one form, although it need not be the only or indeed the broadest form, the invention resides in a security screen door for mobile homes, said screen door comprising:

- a frame forming an opening;

- a lockable, openable section within said frame;

- woven wire intruder resistant mesh covering at least part of said opening formed by said frame;

wherein said openable section is locked or unlocked from an outside using a key and is locked or unlocked from an inside without a key.

Preferably, said openable section comprises a pair of sash screens, at least one of said sash screens slidable on a pair of slider frames between an open position and a closed position.

Preferably, each said sash screen comprises:

- a plurality of frame members, each frame member having a channel section and a clamping portion spaced from said channel section;

- woven wire intruder resistant mesh covering an opening enclosed by said frame and positioned on said clamping portions;

a plurality of clamping members co-acting with respective fastening means to thereby clamp said mesh between said clamping portions and said clamping members with a leveraged clamping action.

5 Preferably, said clamping portions have a serrated profile on a face adjacent said clamping members.

Preferably, each clamping member may also have a serrated profile on a face adjacent said clamping portion.

Suitably, a resilient member is inserted between said clamping member and said clamping portion.

10 Preferably, each said sash screen comprises a Z section, said Z sections interlocking when said sash screens are in the closed position.

Preferably, said slider rails are fastened to a midrail section, said midrail section comprising a clamping portion upon which woven wire intruder resistant mesh is positioned; a clamping member co-acting with respective fastening means to thereby clamp said mesh between said clamping portion of said midrail section and said clamping member with a leveraged clamping action.

The frame of said security screen door may be roll formed, press formed or extruded from one or more frame members.

20 Preferably, each frame member of said security screen door comprises a channel section and a clamping portion spaced from said channel section.

Preferably, woven wire intruder resistant mesh covers the openings enclosed by said frame and said slider rails, said mesh positioned on said clamping portions of said frame; and

25 a plurality of clamping members co-acting with respective fastening means to thereby clamp said mesh between said clamping portions of said

frame and said clamping members with a leveraged clamping action.

The openable section of said security screen door further comprises a first lock mounted on one of said frame members of one of said sash screens, said first lock being lockable and unlockable from the outside using a key and being lockable and unlockable from the inside using a handle.

The security screen door further comprises a second lock mounted on said frame of said screen, said second lock being lockable and unlockable from the inside only without a key.

Preferably, said second lock is lockable and unlockable from the inside using a quick releasing lever.

Further features of the present invention will become apparent from the following detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

To assist in understanding the invention and to enable a person skilled in the art to put the invention into practical effect preferred embodiments of the invention will be described by way of example only with reference to the accompanying drawings, wherein:

FIG 1 shows a perspective view of the outer side of an improved security screen door for a mobile home according to one aspect of the current invention;

FIG 2 shows a perspective view of the inner side of part of the improved security screen door for a mobile home of FIG 1;

FIG 3 shows an end view of a door frame section;

FIG 4 shows a clamping member;

- FIG 5 shows a perspective view of a door frame;
- FIG 6 shows an end view of a slider frame member and a lower slider midrail;
- FIG 7 shows an exploded perspective view of a corner of the slider frame and the lower slider midrail;
- FIG 8 shows an end view of a sash frame;
- FIG 9 shows an exploded perspective view of a corner of the sash frame;
- FIG 10 shows a top sectional view of two sliding sashes and the slider frame;
- FIG 11 shows a perspective view of two sliding sashes;
- FIG 12 shows a sectional view of a slider lock in an unlocked position;
- FIG 13 shows a sectional view of the slider lock of FIG 12 in a locked position;
- FIG 14 shows a door lock in an unlocked position;
- FIG 15 shows the door lock of FIG 14 in a locked position; and
- FIG 16 shows the security screen door and outer door mounted in a doorway of a mobile home.

DETAILED DESCRIPTION OF THE INVENTION

The invention will be discussed in terms of an improved security screen door for a mobile home, but it will be appreciated that the improved security screen door of the present invention may be used in all types of vehicles with living areas such as caravans, mobile homes and the like without deviating from

the scope of the invention.

FIG 1 shows the outer side of an improved security screen door 1 for mobile homes comprising a doorframe 2, top intruder resistant mesh 3, bottom intruder resistant mesh 4, an upper slider midrail 6, a lower slider midrail 7 and an openable middle section 5.

Upper slider midrail 6 extends from one side of doorframe 2 to the other side. Similarly, lower slider midrail 7 extends across doorframe 2 and is substantially parallel to upper slider midrail 6.

Top mesh 3 and bottom mesh 4 are woven grids of stainless steel wire. Suitable mesh dimensions have been described in Australian Patent No. 694515. The most suitable dimensions have been found to be wire diameters from 0.8 mm to 1.2 mm and wire spacing (in weft or warp) from 1 mm to 2.2 mm. Mesh 3 and 4 has been found to be highly effective in resisting break-in attempts by intruders.

Top mesh 3 covers the opening formed by doorframe 2 and upper slider midrail 6. Bottom mesh 4 covers the opening formed by doorframe 2 and lower slider midrail 7. The means of fastening top mesh 3 and bottom mesh 4 to the doorframe 2 and the upper slider midrail 6 and the lower slider midrail 7 respectively will be described below.

Openable middle section 5 comprises slider frame 8, outer sash frame 9, outer sash screen 10, inner sash frame 11, inner sash screen 12 and keyhole 14 of slider lock 15.

Outer sash screen 10 covers the opening formed by outer sash frame 9. Similarly, inner sash screen 12 covers the opening of inner sash frame 11.

Slider frame 8 (not shown in full in FIG 1) forms part of openable middle section

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Shown in FIG 1 are slider frame members 8B and 8D, which extend substantially vertically on opposite sides of openable middle section 5 from lower sliding midrail 7 to upper sliding midrail 6. Slider frame members 8A and 8C (not shown) are obscured in FIG 1 by upper slider midrail 6 and lower slider midrail 7 respectively.

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FIG 2 is a close-up perspective view of the inner side of improved security screen door 1 showing inner sash screen 12, inner sash frame members 11A, 11B, 11C and 11D of inner sash frame 11, slider frame members 8A, 8B and 8C of slider frame 8 and doorframe 2.

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Handle 15 of slider lock 14 is formed on inner sash frame member 11B. Handle 15 corresponds and aligns with keyhole 13 on the outer side of inner sash frame 11. Also shown in FIG 2 is doorjamb 19 of the mobile home (not shown in full). L-shaped striker 17 is mounted on doorjamb 19 adjacent to openable middle section 5 and has aperture 18 formed therein. Elongated pin 16 is rigidly mounted to inner sash frame member 11B and extends outwardly through an aperture in slider frame member 8B substantially perpendicular thereto and terminates in aperture 18 of L-shaped striker 17 as shown. Inner sash screen 12 is biased from beneath by a biasing means in the form of a push spring (not shown) in slider frame member 8C. The push spring urges pin 16 through aperture 18 and maintains the screen door closed when the screen door is an unlocked state.

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Housing 23 for lock 20 is mounted on slider frame member 8D as shown. Lock 20 further comprises a lever 21 connected to pivot 26, which is located in housing 23. Lock aperture 24 is formed on doorframe 2 opposite housing 23.

Located within lock aperture 24 is locking bar 25 which has engagement recess 27 formed thereon. Engagement rod 22 extends from pivot 26 and terminates within engagement recess 27.

FIG 3 shows an end section of doorframe 2. Doorframe 2 is preferably constructed by extruding appropriate lengths of aluminum or any other suitable material and bent as required to form the desired shape. In the example shown, doorframe 2 comprises a bent portion forming the top and sides and a base portion. Doorframe 2 comprises a channel section 28 and an integrally formed clamping portion 29. Clamping portion 29 has a wall section 30, a flange 31, serrated profile 32, arm 33, notch 68 and lip 34. Wall section 30 extends inwardly from channel section 28 and joins flange 31. Serrated profile 32 is located upon flange 31. Arm 33 also extends inwardly from channel section 28 and terminates at lip 34 forming notch 68.

FIG 4 shows a clamping member 35 comprising serrated profile 36 that is engagable with serrated profile 32 on clamping portion 29. An arm 37 extends from serrated profile 36 and terminates at a lip 38 forming notch 69. Lip 38 and notch 69 on clamping member 35 are engagable with notch 68 and lip 34 on clamping portion 29.

Clamping portion 29 and clamping member 35 are engagable to secure top mesh 3 and bottom mesh 4 by means of a leveraged clamping action as described in Australian Patent No. 694515. Clamping member 35 and clamping portion 29 differ from the description in Australian Patent No. 694515 in that they have serrated profiles 36 and 32 respectively.

FIG 5 shows a perspective view of doorframe 2 with all other components of security screen door 1 removed. Doorframe 2 comprises channel section 28

and clamping portion 29 as described, except in a middle section where clamping portion 29 is omitted.

FIG 6 shows an end view of slider frame member 8C located on slider midrail 7 and a person skilled in the art will realize that a similar arrangement applies to slider frame member 8A and upper slider midrail 6, i.e. FIG 6 inverted. Lower slider midrail 7 comprises a base section 50 extending from a clamping portion 29. Clamping portion 29 on lower slider midrail 7 has the same features as that described above for doorframe 2. A vertical section 49 also extends from clamping portion 29.

Slider frame member 8C is shown in FIG 6 and it will be appreciated that slider frame members 8A, 8B and 8D of slider frame 8 have the same cross sectional shape. Slider frame member 8C has an inner finger 40, a middle finger 41 and an inner flange 44 extending from an inner base section 46. A substantially circular channel 39, known in the art as a screw flute, is formed in abutment to inner flange 44 as shown.

An outer base section 47 is separated from inner base section 46 by a step 48. An outer flange 45 and an outer finger 42 extend from outer base section 47 as shown. A substantially circular channel 39 (screw flute) is formed in abutment to outer flange 45. A lip 43 is formed at the extent of outer finger 43 and wraps around vertical section 49 of lower slider midrail 7.

Slider frame member 8C is located upon lower slider midrail 7 as shown in FIG 6. Rivets are used to fasten slider frame member 8C to lower slider midrail 7 although any appropriate fastening means may be used.

FIG 7 shows an exploded perspective view of a corner section of the slider frame members 8B and 8C, and the lower slider midrail 7 arrangement

shown in end view in FIG 6. Slider frame fastening means in the form of screws 51 are used to secure slider frame member 8C to slider frame member 8B. The end sections of slider frame 8C and 8B are angled at forty-five degrees such that adjacent members abut thus forming a substantially ninety-degree corner. The screws are drilled through the base of slider frame member 8C, pass through circular channel 39 and terminate in circular channel 39 of slider frame member 8B. It should be appreciated that another appropriate fastening means may be used such as pop rivets, glue or nails. Furthermore, it is apparent that the joining of slider frame members 8B and 8C is described by way of example only and the same principles apply to the joining of all frame members on slider frame 8.

FIG 8 shows an end view of inner sash frame member 11C of inner sash frame 11. Inner sash frame member 11C comprise a substantially rectangular channel section 52 formed adjacent clamping portion 29, as previously described. Two substantially circular channels 39 (screw flutes) are formed within rectangular channel section 52 at diagonally opposite corners as shown. Member 11C further comprises location pips 70 and slider pips 71. Location pips 70 guide the movement of slider lock bar 56 (described below) therebetween and slider pips 71 reduce the friction of slider lock bar 56 during movement. It should be appreciated that all members on sash frames 9 and 11 are of the same cross section as described for inner sash frame member 11C described above.

FIG 9 shows an exploded perspective view of a corner section of inner sash frames 11C and 11B. Similar to the corner section of slider frame 8 described above, inner sash frames 11C and 11B are fastened together using

fastening means in the form of screws 51 that are forced through the outer frame and into circular channels 39. As mentioned above other fastening means can be similarly used.

5 Clamping member 35 is also shown in FIG 9. As shown, a resilient member in the form of a length of polymonomer tape 53 is optionally inserted between clamping member 35 and clamping portion 29 before any mesh, in this case inner sash screen 12, is inserted between the clamping member 35 and clamping portion 29. The polymonomer tape minimizes the likelihood of corrosion occurring between the mesh and the frame. Tape 53 may be in the
10 form of plastic tape, such as electrical insulation tape or any suitable equivalent known in the art. Screw 51 is located within aperture 67 and secures clamping member 35 to clamping portion 29. The placement of mesh between the clamping members and clamping portions will be discussed in more detail below.

FIG 10 shows a top sectional view of openable middle section 5.
15 Doorframe 2 is fastened by means of rivets, or by other appropriate fastening means, to slider frame members 8B and 8D on opposite sides of security screen door 1. Fastening means such as screws or glue could also be used.

Outer sash frame 9 is located between outer finger 42 and middle finger 41 on slider frame 8 and inner sash frame 11 is located between middle finger
20 41 and inner finger 40 of slider frame 8. Two Z sections 54 and 55 are mounted on outer sash frame member 9B and inner sash frame member 11D as shown.

Outer screen section 10 is fastened to outer sash frame 9 by clamping screen section 10 between clamp members 35 and clamp portions 29 on all outer sash frame members. It will be appreciated that outer screen section 12 is
25 fastened to outer sash frame 11 in a similar manner.

Inner sash frame 11 is movable in a direction substantially parallel to upper midrail 6 and lower midrail 7 (each shown in FIG 1) such that inner sash frame 11 passes on the inside of outer sash frame 9. When inner sash frame 11 abuts slider frame member 8B the openable middle section 5 is in the closed position. When inner sash frame 11 does not abut slider frame member 8B the openable middle section 5 is in the opened position. When openable middle section is in the opened position an aperture is formed through security screen door 1 providing access from one side of the closed door to the other.

When openable middle section 5 is in the closed position, Z sections 54 and 55 interlock, as shown, and provide added strength to openable middle section 5 by binding outer sash frame 9 to inner sash frame 11. Additionally, Z sections 54 and 55 prevent an intruder levering inner sash frame 11 and outer sash frame 9 apart.

FIG 11 shows a perspective view of inner sash frame 11 and outer sash frame 9 when assembled. Openable middle section 5 is lockable when in the closed position and outer sash frame 9 is fixed in place to slider frame member 8C by any suitable fastening means, such as screws.

FIG 12 shows a sectional view of slider lock 14 when openable middle section 5 is in the closed position and is not locked. A slider lock bar 56 is located within channel section 52 of sash frame member 11B defined by location pips 70 and is moveable in a vertical direction as discussed below. Slider lock bar 56 has recess 60 located thereon adjacent to slider lock 14. Recess 60 is formed from faces 61A and 61B. A pin 58 on slider lock 14 is engagable with either face 61A or 61B within recess 60. Slider frame member 8C has an aperture 57 located thereon and formed such that is able to receive slider lock

bar 56.

As shown in FIG 12, pin 58 contacts face 61A and slider lock bar 56 does not penetrate aperture 57. Hence, inner sash frame 11 can be moved freely and openable middle section 5 can be moved between the opened and closed positions.

FIG 13 shows a sectional view of slider lock 14 in FIG 12 when openable middle section 5 is in the closed and locked position. Slider lock 14 is rotated around pivot 59 and engages face 62A thus driving slider lock bar 56 into aperture 57. Hence, as slider lock bar is located within aperture 57, inner sash frame 11 cannot be moved to the opened position and thus openable middle section 5 is locked in the closed position.

Pin 58 is rotated around pivot 59 to engage either face 61A or face 61B by turning slider lock handle 15 from the outside or by inserting a complementary key into keyhole 13 from the outside and turning the key.

FIG 14 shows lock 20 in the unlocked position. Doorframe 2 is not present in this figure to assist in understanding the operation of door lock 20. Engagement rod 22 of door lock 20 resides within engagement recess 27 of locking bar 25. Engagement bar 63 is coupled to locking bar 25 and extends vertically within channel section 28 of doorframe 2.

Locking pins 65 are located at spaced intervals along engagement bar 63. Pins 65 are formed above corresponding locking members 64 which have contained therein a locking aperture (not shown) to accommodate pins 65. Locking members 64 are formed on doorjamb 19 (shown in FIG 2). Lock 20 is pivotable about pivot 26, which allows engagement rod 22 to contact two faces (not shown) within engagement recess 27. This contact drives engagement bar

63 up and down and thus forces locking pin 65 into and out of locking aperture (not shown) on locking members 64.

In FIG. 14 locking pin 65 is not located within locking member 64 and therefore screen door 1 is not locked to doorjamb 19 and can be opened and closed freely.

FIG. 15 shows lock 20 in the locked position. Engagement rod 22 has been pivoted around pivot 26 by a force applied on lever 21. Thus, engagement rod 22 is driven into the lower face (not shown) of engagement recess 27. This operatively drives engagement bar 63 down and secures locking pins 65 within locking apertures (not shown) of locking members 64. This ensures that security screen door 1 cannot be opened or closed.

When lever 21 is in the locked position shown in FIG. 15, applying a downward force on lever 21, security screen door 1 can be unlocked and by applying an upward force on lever 21, security screen door 1 is locked.

Slider lock 14 and lock 20 are used in combination to lock and unlock, and thus enter and exit, the mobile home to which the security screen door of the present invention is fitted, as shown in FIG. 16.

Consider the situation when security screen door 1 is closed, lock 20 is locked, openable middle section 5 is in the locked position and a person wishes to enter the mobile home from the outside. The person must unlock slider lock 14 by inserting a key into keyhole 13 and turning lock 20. Openable middle section 5 is then unlocked and the person is free to move inner sash frame 11 such that openable middle section 5 is in the opened position. In this case inner sash frame 11 is substantially behind outer sash frame 9, from the persons perspective, and an aperture is formed in the previous position inner sash frame

11. The person is then able to reach through this aperture and move lever 21 downwards such that lock 20 is unlocked and can be opened. The person is then free to move security screen door 1 between the opened and closed position and the person is able to enter the mobile home.

5 Considering the case where security screen door 1 is closed, lock 20 is locked, openable middle section 5 is in the closed and locked position, the person is inside and wants to exit the mobile home. The person merely has to apply a downward force on lever 21 to release lock 20 and unlock screen door 1. The person is then able to exit the mobile home by opening security screen door
10 1 without needing a key. Hence, lever 21 facilitates quick release of lock 20.

 If the outer door 66, shown in FIG 16, is closed and locked as well as screen door 1, the person must first unlock middle section 5 by turning slider lock handle 15 to unlock slider lock 14. Inner sash frame 11 is then slid such that
15 openable middle section 5 is in the opened position. The person then reaches through the aperture formed in openable middle section 5 and unlocks outer door lock 67, as shown in FIG 16. Security screen door 1 is then unlocked and opened as described above.

 The improved security screen door for mobile homes of the present invention addresses at least some of the problems of the prior art. The security
20 screen door provides a significantly increased level of security over prior art mobile home devices due to the intruder resistant mesh and clamping member arrangements, which have a higher resistance to penetration. Australian Patent No. 694515 has been improved upon due to the clamping member and portions having a serrated contact with the mesh and the insertion of the polymonomer
25 tape at the contact.

The simple keyless exit procedure reduces the chance of occupants being trapped within the mobile home in the event of fire or other emergency even if the occupants are hysterical and/or frightened. This feature is especially significant to the mobile home and campervan industry where a large proportion of elderly people utilize these vehicles for taking traveling holidays.

Throughout this specification the aim has been to describe the preferred embodiments of the invention without limiting the invention to any one embodiment or specific collection of features. Other embodiments of the present invention are envisaged that do not depart from the scope of the invention as described herein. For example, the Applicant envisages that variations to the locks described may be made, such as mounting quick release lever 21 in an alternative orientation e.g. vertically rather than horizontally. Slider lock bar 56 may alternatively be moved into and out of an aperture in upper slider frame member. As a further alternative, slider lock 14 may comprise two pins 58, which drive a first and second slider lock bar 56 into and out of a first and second aperture in upper and lower slider frames for greater security.

Dated this Sixteenth day of May 2003

CRIMSAFE SECURITY SYSTEMS PTY LTD

By their Patent Attorneys

FISHER ADAMS KELLY

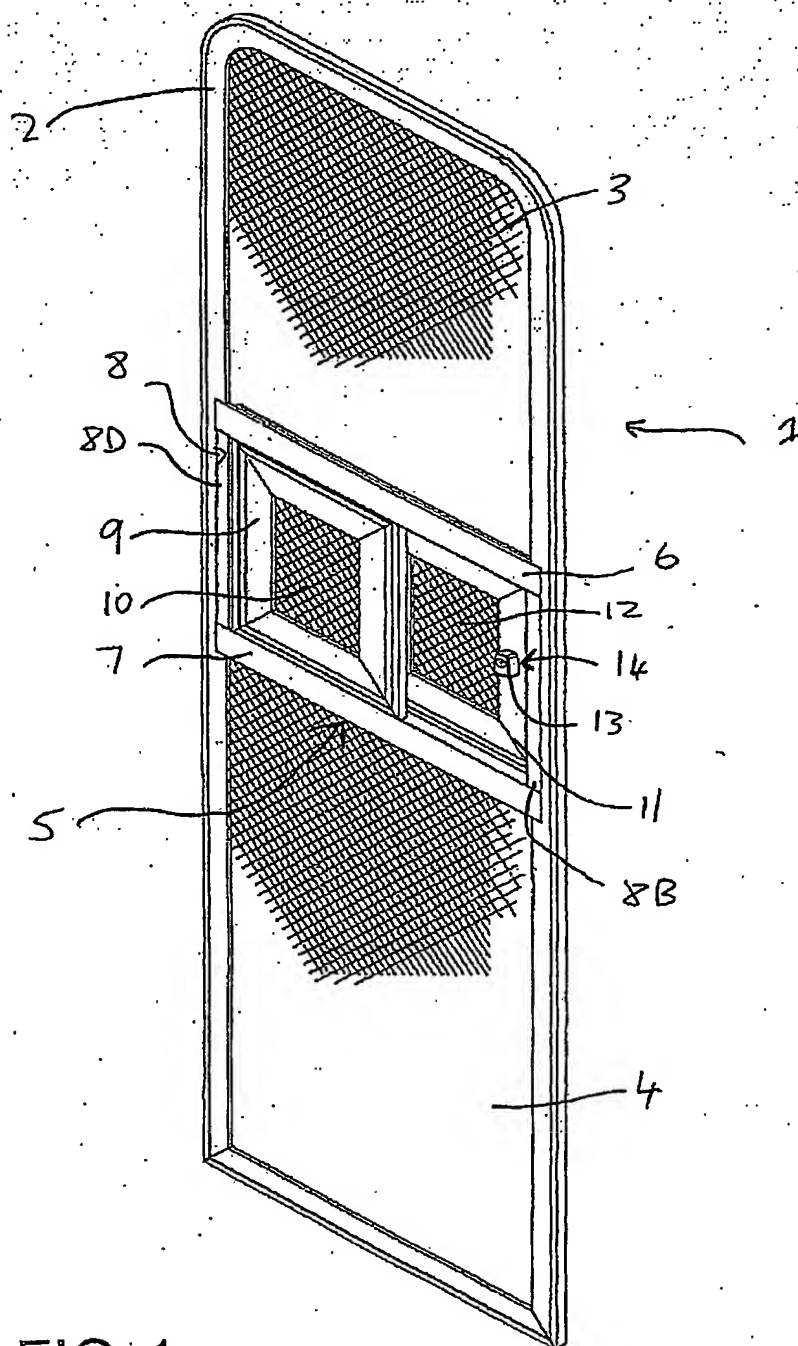
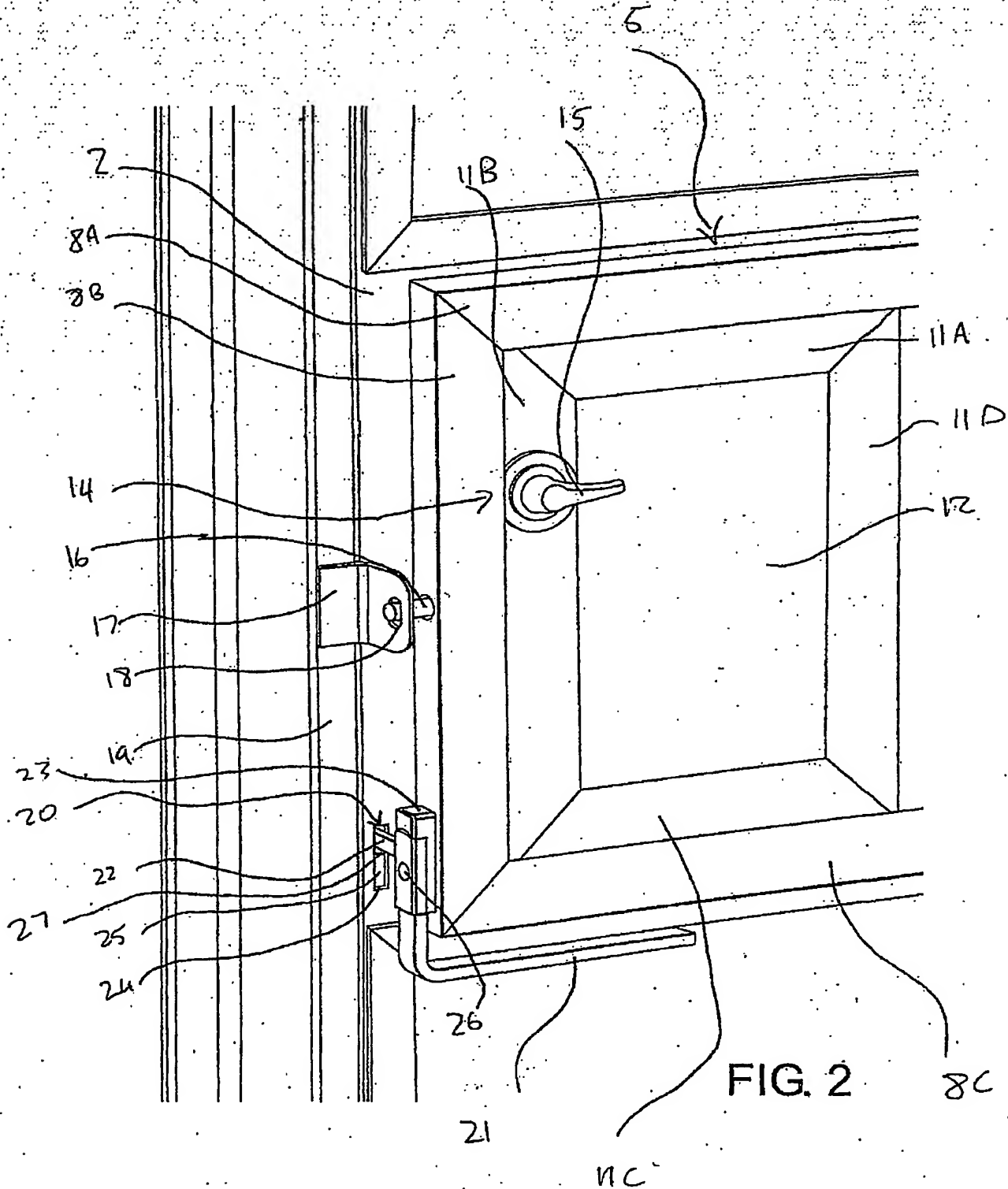


FIG. 1

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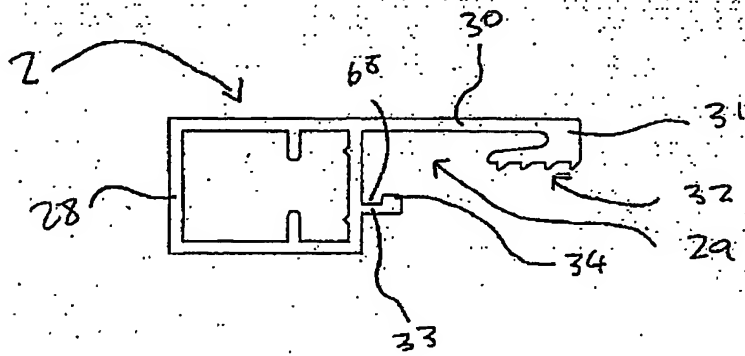


FIG. 3

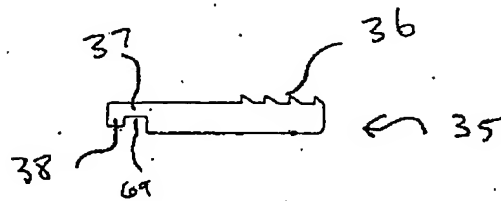


FIG. 4

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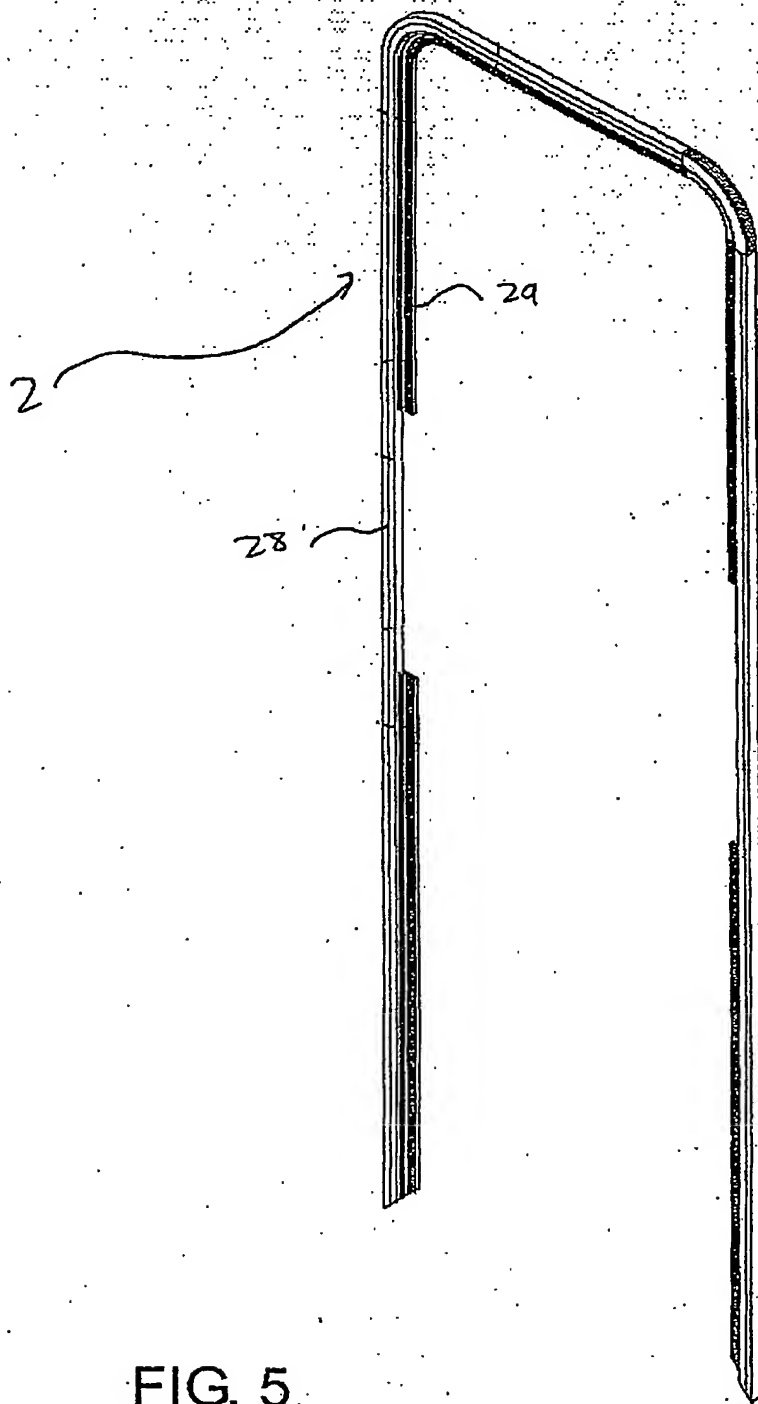


FIG. 5.



FIG. 6

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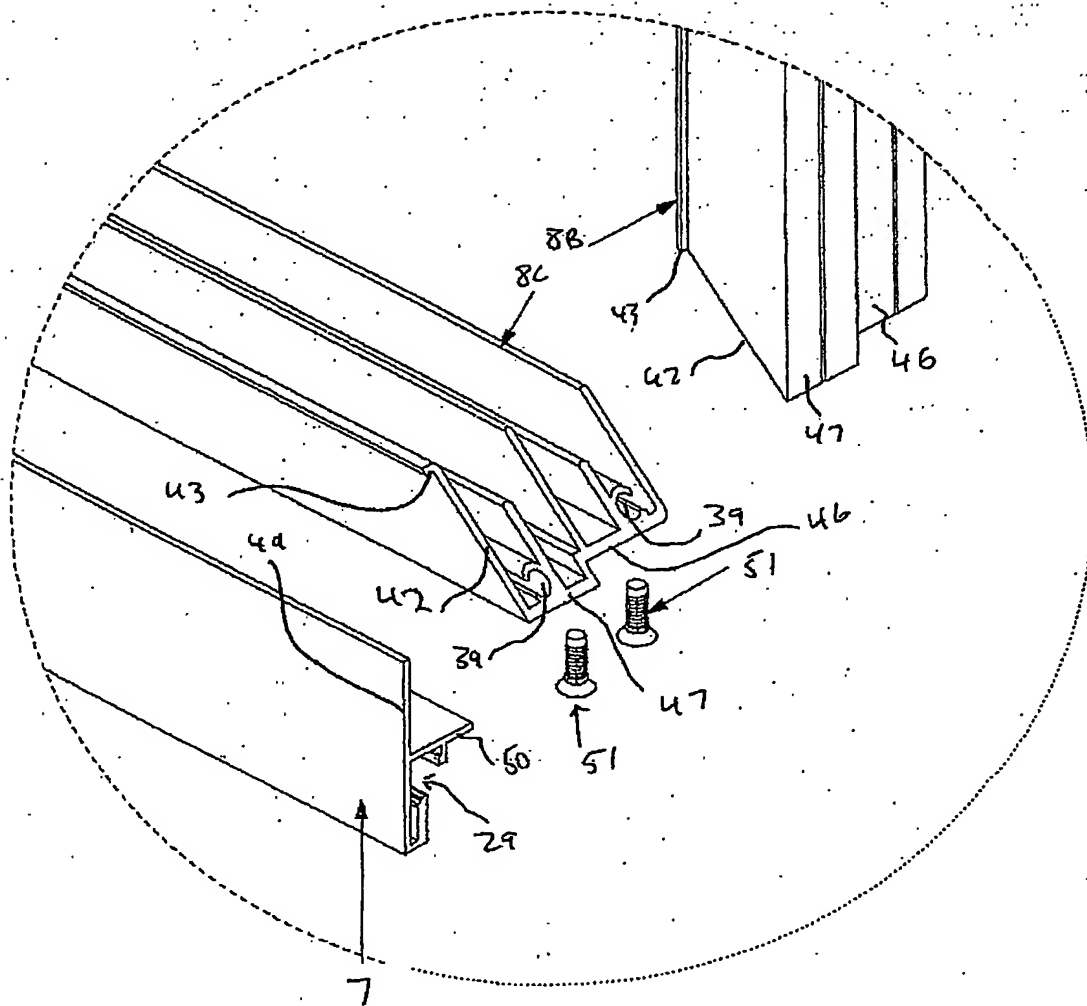


FIG. 7

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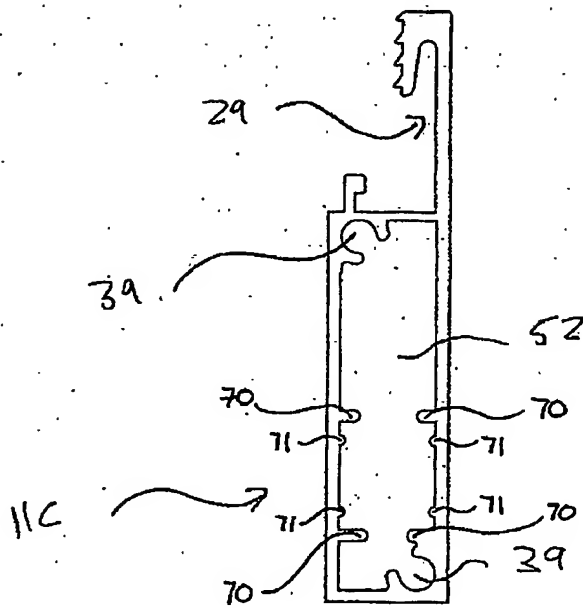


FIG. 8

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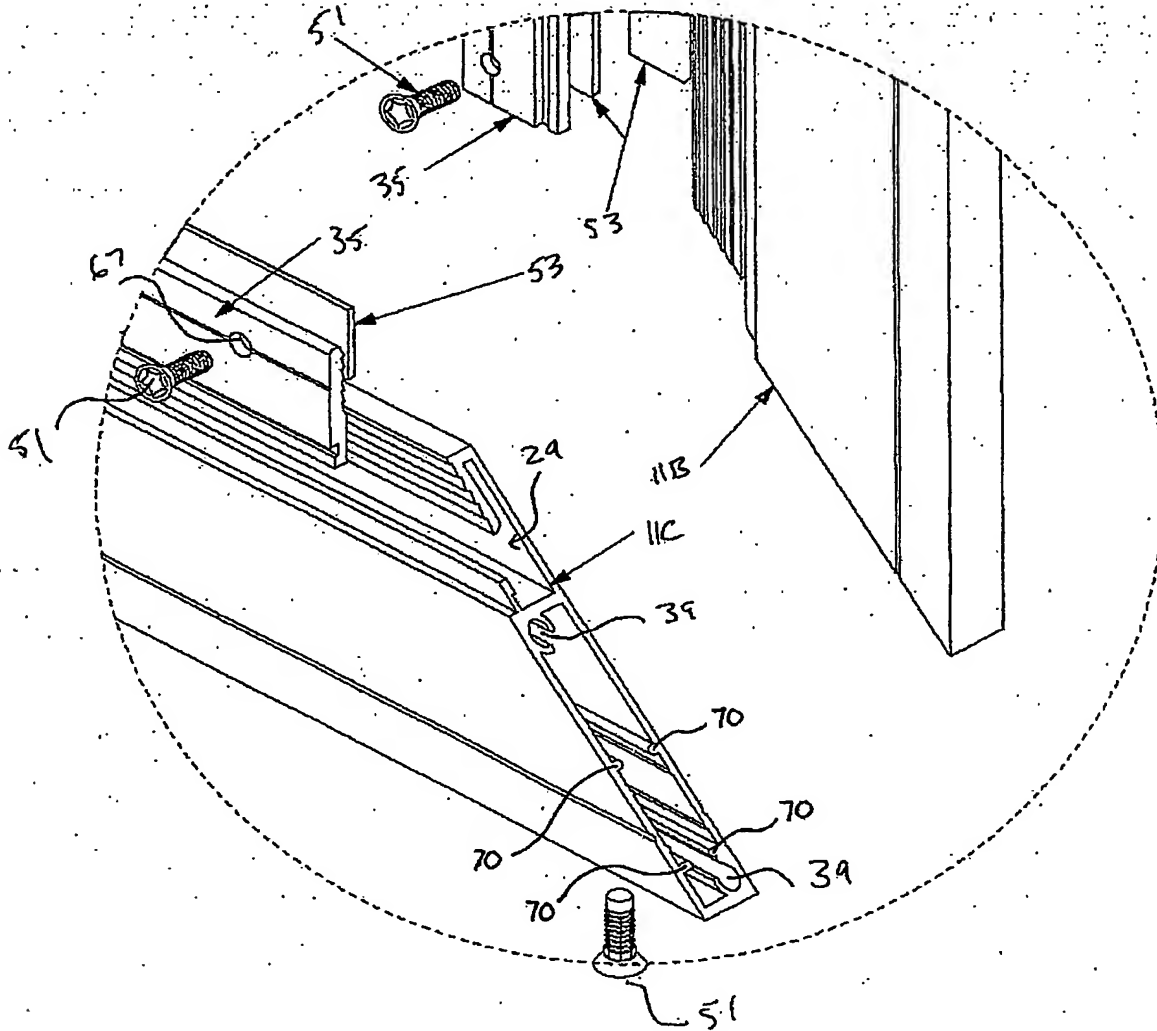


FIG. 9

FIG. 10

FIG. 11

FIG. 11

F16 12

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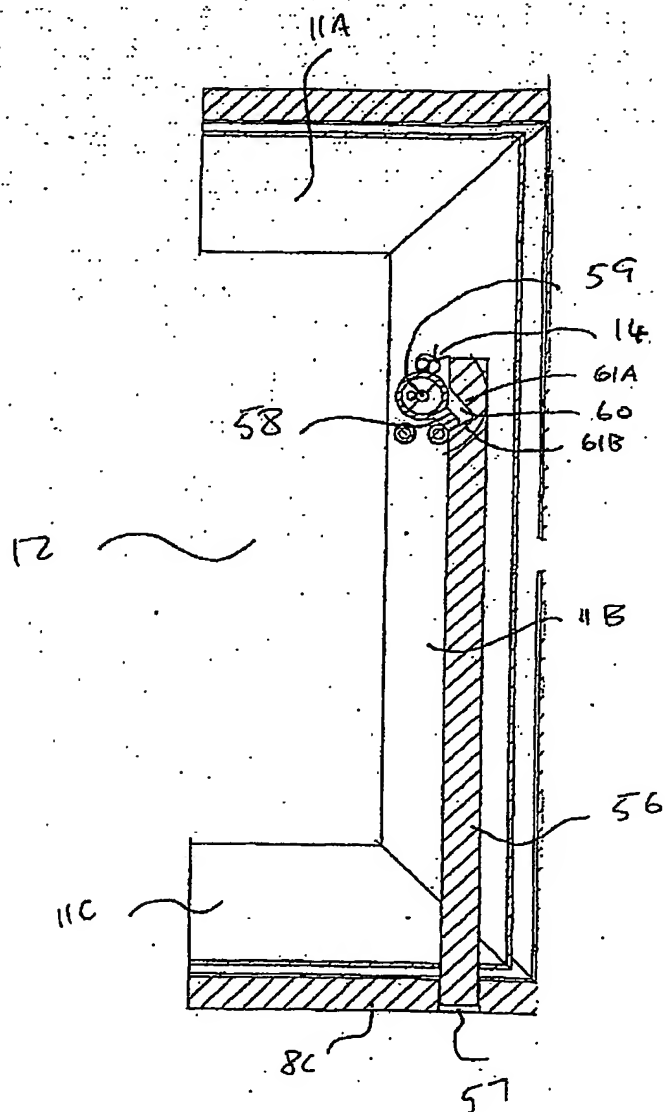


FIG 13

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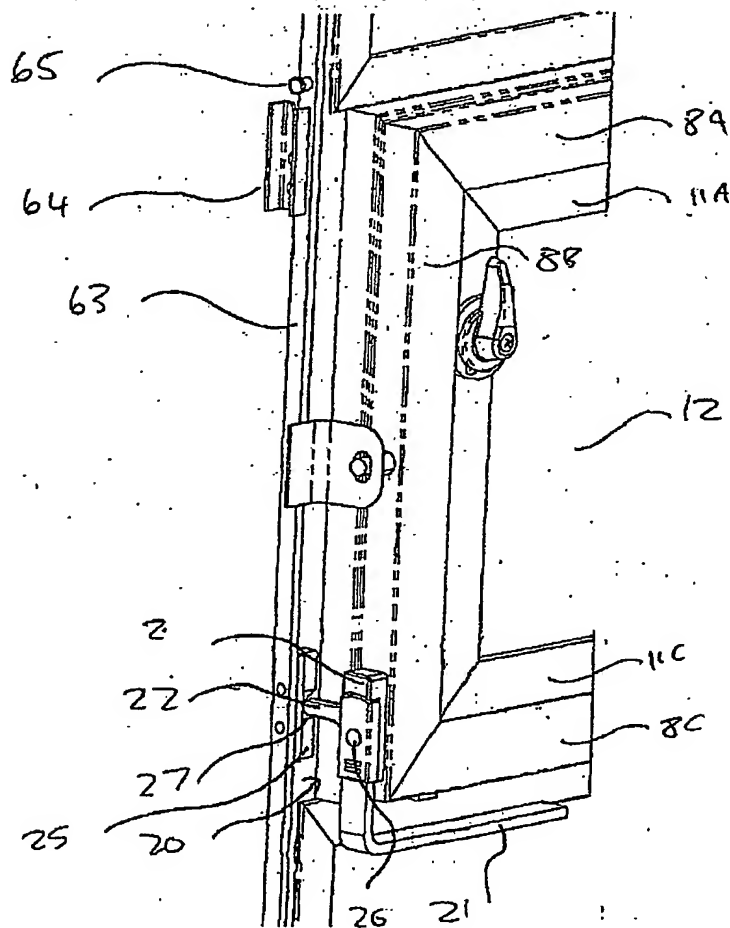


FIG 14

FIG 15

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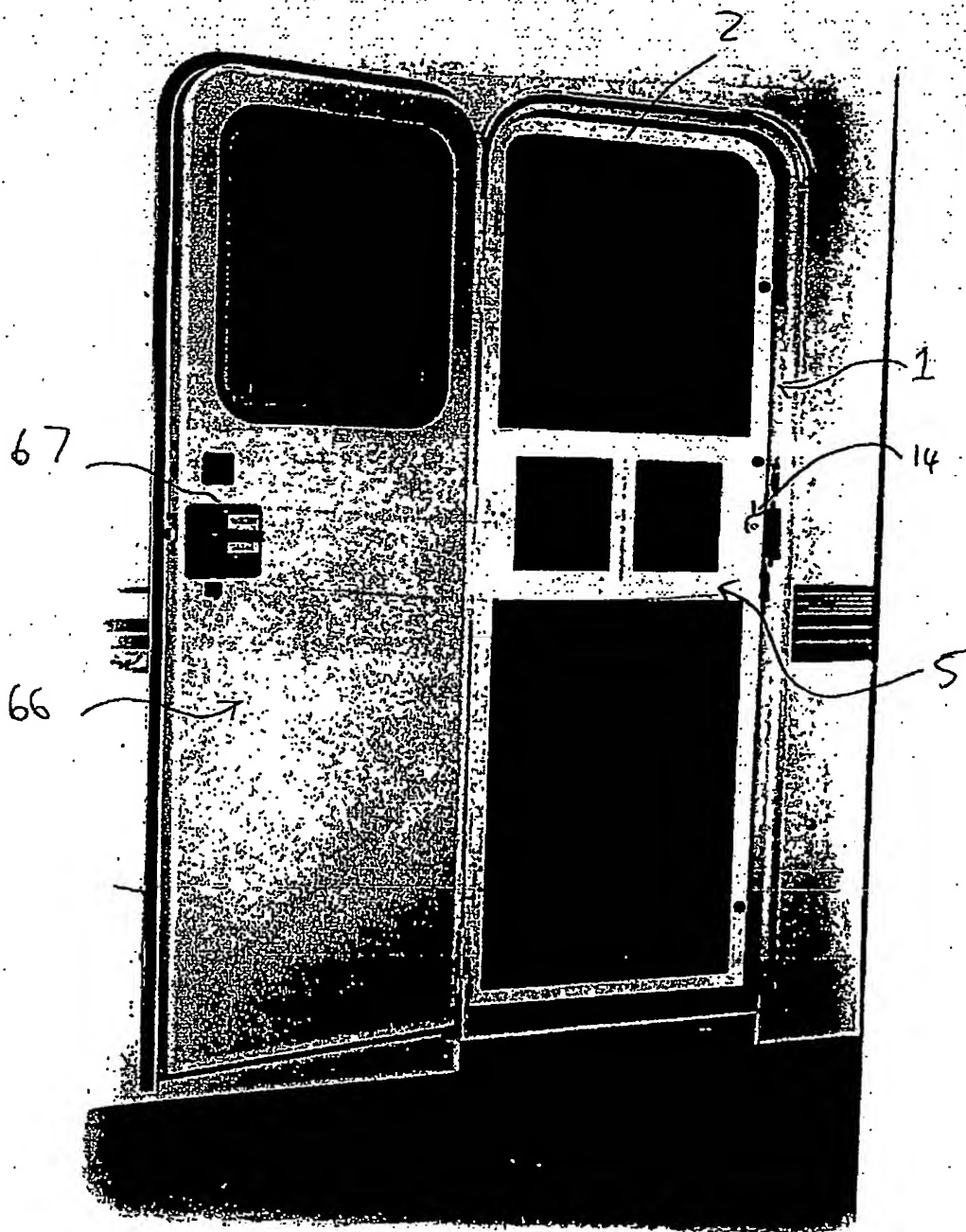


FIG 16

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